

# SEQUENCE LISTING

<110> Bellacosa, Alfonso

<120> Methods for Detection of Transition  
Single-Nucleotide Polymorphisms

<130> FCCC 96-21

<140> 09/629,222

<141> 2000-07-31

<150> 09/463,891

<151> 2000-01-28

<150> PCT/US98/15828

<151> 1998-07-28

<150> 60/053,936

<151> 1997-07-28

<160> 73

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Glu Cys Arg Lys Ser Val Pro Cys Gly Trp Glu Arg Val Val Lys Gln  
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Arg Leu Phe Gly Lys Thr Ala Gly Arg Phe Asp Val Tyr Phe Ile Ser  
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Cys Ile Ser Asp Ala Gly Ala Cys Gly Glu Thr Leu Ser Val Thr Ser  
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Glu Glu Asn Ser Leu Val Lys Lys Lys Glu Arg Ser Leu Ser Ser Gly  
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Gln Glu Thr Leu Phe His Asp Pro Trp Lys Leu Leu Ile Ala Thr Ile  
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 Lys Tyr Pro Ile Glu Leu His Gly Ile Gly Lys Tyr Gly Asn Asp Ser  
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 Tyr Arg Ile Phe Cys Val Asn Glu Trp Lys Gln Val His Pro Glu Asp  
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Cys	Ser	Ala	Lys	Asp	Ser	Glu	His	Asn	Glu	Lys	Tyr	Glu	Asp	Thr	Phe
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Asn Cys Ser Pro Thr Arg Lys Asp Phe Thr Glu Asp Thr Ile Pro Arg		
385	390	400
Thr Gln Ile Glu Arg Arg Lys Thr Ser Leu Tyr Phe Ser Ser Lys Tyr		
405	410	415
Asn Lys Glu Ala Leu Ser Pro Pro Arg Arg Lys Ala Phe Lys Lys Trp		
420	425	430
Thr Pro Pro Arg Ser Pro Phe Asn Leu Val Gln Glu Thr Leu Phe His		
435	440	445
Asp Pro Trp Lys Leu Leu Ile Ala Thr Ile Phe Leu Asn Arg Thr Ser		
450	455	460
Gly Lys Met Ala Ile Pro Val Leu Trp Lys Phe Leu Glu Lys Tyr Pro		
465	470	475
Ser Ala Glu Val Ala Arg Thr Ala Asp Trp Arg Asp Val Ser Glu Leu		
485	490	495
Leu Lys Pro Leu Gly Leu Tyr Asp Leu Arg Ala Lys Thr Ile Val Lys		
500	505	510
Phe Ser Asp Glu Tyr Leu Thr Lys Gln Trp Lys Tyr Pro Ile Glu Leu		
515	520	525
His Gly Ile Gly Lys Tyr Gly Asn Asp Ser Tyr Arg Ile Phe Cys Val		
530	535	540
Asn Glu Trp Lys Gln Val His Pro Glu Asp His Lys Leu Asn Lys Tyr		
545	550	555
His Asp Trp Leu Trp Glu Asn His Glu Lys Leu Ser Leu Ser		
565	570	

<210> 25  
 <211> 2152  
 <212> DNA  
 <213> Homo sapiens

<400> 25

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cgcggagctg	ccccaccgt	cacctctagt	gagcgccctag	tccagaccc	gccgaatgac	240
ctccgcaaaag	aagatgttgc	tatggaattg	gaaagagtgg	gagaagatga	ggaacaaatg	300
atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aaccctatgc	ttctgctcag	360
tttggtgcta	ctgcaggaac	agaatgccgt	aagtctgtcc	catgtggatg	ggaaagagtt	420
gtgaagcaaa	ggttatttgg	gaagacagca	ggaagatttg	atgtgtactt	tatcagccca	480
caaggactga	agttcagatc	caaaagttca	cttgctaatt	atcttcacaa	aaatggagag	540
acttctctta	agccagaaga	ttttgatatt	actgtacttt	ctaaaagggg	tatcaagtca	600
agatataaag	actgcagcat	ggcagccctg	acatccctac	tacaaaacca	aagtaacaat	660
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aagcaggtgc	accctgaaga	ccacaaatta	aataaatatc	atgactgggt	ttgggaaaat	1860

catgaaaaat	taagtctatc	ttaaactctg	cagctttcaa	gctcatctgt	tatgcatagc	1920
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taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatgggtgga	2040
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<210> 26  
 <211> 2152  
 <212> DNA  
 <213> Homo sapiens

<400> 26						
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atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aacctatcgc	ttctgtctag	360
tttgggtgcta	ctgcaggaac	agaatgccgt	aagtctgtcc	catgtggatg	ggaaagagtt	420
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caaggactga	agttcagatc	caaaagtcca	cttgctaatt	atcttcacaa	aaatggagag	540
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tcaaactgga	acctcaggac	ccgaagcaag	tgcaaaaagg	atgtgtttat	gccgcccaagt	720
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taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatgggtgga	2040
tttttgtctac	tgaatgtgtt	tgaacatggt	ttgagatttt	tttaaaataa	attattattt	2100
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<210> 27  
 <211> 2152  
 <212> DNA  
 <213> Homo sapiens

<400> 27						
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cgcggaagctg	ccccaccgt	cacctctagt	gagcgccctag	tcccagaccc	gccgaatgac	240
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atgataaaaa	gaagcagtga	atgtaatccc	ttgctacaag	aacctatcgc	ttctgtctag	360
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caaggactga	agttcagatc	caaaagtcca	cttgctaatt	atcttcacaa	aaatggagag	540

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tcaaactgga	acctcaggac	ccgaagcaag	tgcaaaaagg	atgtgtttat	gccgccaaat	720
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aagggtgacta	ttttgaaaagg	aatcccaatt	aagaaaacta	aaaaaggatg	taggaagagc	900
tgttcaggtt	ttgttcaaaag	tgatagcaaa	agagaatctg	tgtgtaataa	agcagatgct	960
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tttgactctc	aaaaaagctt	aattaagtac	aaccaaccac	ctttccagcc	atagagattt	1980
taattagccc	aactagaagc	ctagtgtgtg	tgctttctta	atgtgtgtgc	caatgggtgga	2040
tttttgctac	tgaatgtgtt	tgaacatggt	ttgagatttt	tttaaaataa	attattattt	2100
gacaacaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aa	2152

<210> 28  
 <211> 942  
 <212> DNA  
 <213> Homo sapiens

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tttgtcacct	ctggcctgt	tcctgtcatt	ccctatttgt	gtgctatctc	taagcctgac	300
gtgggttttcc	tcctgtcaaa	agtacaccac	tacaggaaag	caggaaaggtt	tgggccttgc	360
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tgcttcagcc	ctgttgaata	tgcccagcct	gtggcatgct	ggtgggtcatc	ctggcagctg	480
gtgggtggcc	tggtatgctg	cccactcagc	ttgagactca	ccctcatgca	ttcagccagt	540
aggtctggcc	aagcctgaac	tgaaggacca	tggtcctatc	ccagcttcat	cacagcaatc	600
cattgtgacc	tgagaatcca	tttaacctct	cggtctagaa	cctccttctg	gaaagtgagg	660
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<210> 29  
 <211> 384  
 <212> PRT  
 <213> Mus musculus

<400> 29															
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Asp	Leu	Val	Ile	Ser	Ser	Glu	Arg	Ser	Ser	Leu	Leu	Gln	Glu	Pro	Thr
			20					25					30		
Ala	Ser	Thr	Leu	Ser	Ser	Thr	Thr	Ala	Thr	Glu	Gly	His	Lys	Pro	Val
		35					40					45			
Pro	Cys	Gly	Trp	Glu	Arg	Val	Val	Lys	Gln	Arg	Leu	Ser	Gly	Lys	Thr

50	55	60
Ala Gly Lys Phe Asp Val Tyr Phe Ile Ser Pro Gln Gly Leu Lys Phe		
65	70	75
Arg Ser Lys Arg Ser Leu Ala Asn Tyr Leu Lys Asn Gly Glu Thr		80
	85	90
Phe Leu Lys Pro Glu Asp Phe Asn Phe Thr Val Leu Pro Lys Gly Ser		95
	100	105
Ile Asn Pro Gly Tyr Lys His Gln Ser Leu Ala Ala Leu Thr Ser Leu		110
	115	120
Gln Pro Asn Glu Thr Asp Val Ser Lys Gln Asn Leu Lys Thr Arg Ser		125
	130	135
Lys Trp Lys Thr Asp Val Leu Pro Leu Pro Ser Gly Thr Ser Glu Ser		140
145	150	155
Pro Glu Ser Ser Gly Leu Ser Asn Ser Asn Ser Ala Cys Leu Leu Leu		160
	165	170
Arg Glu His Arg Asp Ile Gln Asp Val Asp Ser Glu Lys Arg Arg Lys		175
	180	185
Ser Lys Arg Lys Val Thr Val Leu Lys Gly Thr Ala Ser Gln Lys Thr		190
	195	200
Lys Gln Lys Cys Arg Lys Ser Leu Leu Glu Ser Thr Gln Arg Asn Arg		205
	210	215
Lys Arg Ala Ser Glu Asp Ser Ile Pro Arg Thr Gln Val Glu Lys Arg		220
225	230	235
Lys Thr Ser Leu Tyr Phe Ser Ser Lys Tyr Asn Lys Glu Ala Leu Ser		240
	245	250
		255
Pro Pro Arg Arg Lys Ser Phe Lys Lys Trp Thr Pro Pro Arg Ser Pro		
	260	265
Phe Asn Leu Val Gln Glu Ile Leu Phe His Asp Pro Trp Lys Leu Leu		270
	275	280
Ile Ala Thr Ile Phe Leu Asn Arg Thr Ser Gly Lys Met Ala Ile Pro		285
	290	295
Val Leu Trp Glu Phe Leu Glu Lys Tyr Pro Ser Ala Glu Val Ala Arg		300
305	310	315
Ala Ala Asp Trp Arg Asp Val Ser Glu Leu Leu Lys Pro Leu Gly Leu		320
	325	330
Tyr Asp Leu Arg Ala Lys Thr Ile Ile Lys Phe Ser Asp Glu Tyr Leu		335
	340	345
Thr Lys Gln Trp Arg Tyr Pro Ile Glu Leu His Gly Ile Trp Leu Lys		350
	355	360
Tyr Gly Asn Asp Ser Tyr Arg Ile Phe Cys Val Asn Glu Trp Lys Gln		365
370	375	380

<210> 30  
 <211> 119  
 <212> PRT  
 <213> Homo sapiens

<400> 30
Lys Glu Asp Val Ala Met Glu Leu Glu Arg Val Gly Glu Asp Glu Glu
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Gln Met Met Ile Lys Arg Ser Ser Glu Cys Asn Pro Leu Leu Gln Glu
20 25 30
Pro Ile Ala Ser Ala Gln Phe Gly Ala Thr Ala Gly Thr Glu Cys Arg
35 40 45
Lys Ser Val Pro Cys Gly Trp Glu Arg Val Val Lys Gln Arg Leu Phe
50 55 60
Gly Lys Thr Ala Gly Arg Phe Asp Val Tyr Phe Ile Ser Pro Gln Gly
65 70 75 80
Leu Lys Phe Arg Ser Lys Ser Ser Leu Ala Asn Tyr Leu His Lys Asn
85 90 95
Gly Glu Thr Ser Leu Lys Pro Glu Asp Phe Asp Phe Thr Val Leu Ser
100 105 110
Lys Arg Gly Ile Lys Ser Arg
115

<210> 31  
 <211> 132  
 <212> PRT  
 <213> Rattus

<400> 31  
 Lys Glu Asp Lys Glu Gly Lys His Glu Pro Leu Gln Pro Ser Ala His  
 1 5 10 15  
 His Ser Ala Glu Pro Ala Glu Ala Gly Lys Ala Glu Thr Ser Glu Ser  
 20 25 30  
 Ser Gly Ser Ala Pro Ala Val Pro Glu Ala Ser Ala Ser Pro Lys Gln  
 35 40 45  
 Arg Arg Ser Ile Ile Arg Asp Arg Gly Pro Met Tyr Asp Asp Pro Thr  
 50 55 60  
 Leu Pro Glu Gly Trp Thr Arg Lys Leu Lys Gln Arg Lys Ser Gly Arg  
 65 70 75 80  
 Ser Ala Gly Lys Tyr Asp Val Tyr Leu Ile Asn Pro Gln Gly Lys Ala  
 85 90 95  
 Phe Arg Ser Lys Val Glu Leu Ile Ala Tyr Phe Glu Lys Val Gly Asp  
 100 105 110  
 Thr Ser Leu Asp Pro Asn Asp Phe Asp Phe Thr Val Thr Gly Arg Gly  
 115 120 125  
 Ser Pro Ser Arg  
 130

<210> 32  
 <211> 126  
 <212> PRT  
 <213> Homo sapiens

<400> 32  
 Asp Pro Trp Lys Leu Leu Ile Ala Thr Ile Phe Leu Asn Arg Thr Ser  
 1 5 10 15  
 Gly Lys Met Ala Ile Pro Val Leu Trp Lys Phe Leu Glu Lys Tyr Pro  
 20 25 30  
 Ser Ala Glu Val Ala Arg Thr Ala Asp Trp Arg Asp Val Ser Glu Leu  
 35 40 45  
 Leu Lys Pro Leu Gly Leu Tyr Asp Leu Arg Ala Lys Thr Ile Val Lys  
 50 55 60  
 Phe Ser Asp Glu Tyr Leu Thr Lys Gln Trp Lys Tyr Pro Ile Glu Leu  
 65 70 75 80  
 His Gly Ile Gly Lys Tyr Gly Asn Asp Ser Tyr Arg Ile Phe Cys Val  
 85 90 95  
 Asn Glu Trp Lys Gln Val His Pro Glu Asp His Lys Leu Asn Lys Tyr  
 100 105 110  
 His Asp Trp Leu Trp Glu Asn His Glu Lys Leu Ser Leu Ser  
 115 120 125

<210> 33  
 <211> 184  
 <212> PRT  
 <213> E. coli

<400> 33  
 Ser Pro Phe Glu Leu Leu Ile Ala Val Leu Leu Ser Ala Gln Ala Thr  
 1 5 10 15  
 Asp Val Ser Val Asn Lys Ala Thr Ala Lys Leu Tyr Pro Val Ala Asn  
 20 25 30  
 Thr Pro Ala Ala Met Leu Glu Leu Gly Val Glu Gly Val Lys Thr Tyr  
 35 40 45  
 Ile Lys Thr Ile Gly Leu Tyr Asn Ser Lys Ala Glu Asn Ile Ile Lys

50	55	60
Thr Cys Arg Ile Leu Leu Glu Gln His Asn Gly Glu Val Pro Glu Asp		
65	70	75
Arg Ala Ala Leu Glu Ala Leu Pro Gly Val Gly Arg Lys Thr Ala Asn		80
	85	90
Val Val Leu Asn Thr Ala Phe Gly Trp Pro Thr Ile Ala Val Asp Thr		95
	100	105
His Ile Phe Arg Val Cys Asn Arg Thr Gln Phe Ala Pro Gly Lys Asn		110
	115	120
Val Glu Gln Val Glu Glu Lys Leu Leu Lys Val Val Pro Ala Glu Phe		125
	130	135
Lys Val Asp Cys His His Trp Leu Ile Leu His Gly Arg Tyr Thr Cys		140
145	150	155
Ile Ala Arg Lys Pro Arg Cys Gly Ser Cys Ile Ile Glu Asp Leu Cys		160
	165	170
Glu Tyr Lys Glu Lys Val Asp Ile		175
	180	

<210> 34  
 <211> 188  
 <212> PRT  
 <213> M. thermoformicum

<400> 34
Asp Pro Tyr Val Ile Leu Ile Thr Glu Ile Leu Leu Arg Arg Thr Thr
1 5 10 15
Ala Gly His Val Lys Lys Ile Tyr Asp Lys Phe Phe Val Lys Tyr Lys
20 25 30
Cys Phe Glu Asp Ile Leu Lys Thr Pro Lys Ser Glu Ile Ala Lys Asp
35 40 45
Ile Lys Glu Ile Gly Leu Ser Asn Gln Arg Ala Glu Gln Leu Lys Glu
50 55 60
Leu Ala Arg Val Val Ile Asn Asp Tyr Gly Gly Arg Val Pro Arg Asn
65 70 75 80
Arg Lys Ala Ile Leu Asp Leu Pro Gly Val Gly Lys Tyr Thr Cys Ala
85 90 95
Ala Val Met Cys Leu Ala Phe Gly Lys Lys Ala Ala Met Val Asp Ala
100 105 110
Asn Phe Val Arg Val Ile Asn Arg Tyr Phe Gly Gly Ser Tyr Glu Asn
115 120 125
Leu Asn Tyr Asn His Lys Ala Leu Trp Glu Leu Ala Glu Thr Leu Val
130 135 140
Pro Gly Gly Lys Cys Arg Asp Phe Asn Leu Gly Leu Met Asp Phe Ser
145 150 155 160
Ala Ile Ile Cys Ala Pro Arg Lys Pro Lys Cys Glu Lys Cys Gly Met
165 170 175
Ser Lys Leu Cys Ser Tyr Tyr Glu Lys Cys Ser Thr
180 185

<210> 35  
 <211> 185  
 <212> PRT  
 <213> M. luteus

<400> 35
Thr Pro Phe Glu Leu Leu Val Ala Thr Val Leu Ser Ala Gln Thr Thr
1 5 10 15
Asp Val Arg Val Asn Ala Ala Thr Pro Ala Leu Phe Ala Arg Phe Pro
20 25 30
Asp Ala His Ala Met Ala Ala Ala Thr Glu Pro Glu Leu Gln Glu Leu
35 40 45
Val Arg Ser Thr Gly Phe Tyr Arg Asn Lys Ala Ser Ala Ile Leu Arg
50 55 60
Leu Ser Gln Glu Leu Val Gly Arg His Asp Gly Glu Val Pro Ala Arg



<210> 38  
 <211> 76  
 <212> PRT  
 <213> Homo sapiens

<400> 38  
 Met Ala Glu Asp Trp Leu Asp Cys Pro Ala Leu Gly Pro Gly Trp Lys  
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 Arg Arg Glu Val Phe Arg Lys Ser Gly Ala Thr Cys Gly Arg Ser Asp  
 20 25 30  
 Thr Tyr Tyr Gln Ser Pro Thr Gly Asp Arg Ile Arg Ser Lys Val Glu  
 35 40 45  
 Leu Thr Arg Tyr Leu Gly Pro Ala Cys Asp Leu Thr Leu Phe Asp Phe  
 50 55 60  
 Lys Gln Gly Ile Leu Cys Tyr Pro Ala Pro Lys Ala  
 65 70 75

<210> 39  
 <211> 24  
 <212> DNA  
 <213> Homo sapiens

<400> 39  
 taaaaaaaaa agaaagatca ttga 24

<210> 40  
 <211> 14  
 <212> DNA  
 <213> Homo sapiens

<400> 40  
 gaaagatcat tgag 14

<210> 41  
 <211> 16  
 <212> DNA  
 <213> Homo sapiens

<400> 41  
 taaaaaagga tgtagg 16

<210> 42  
 <211> 10  
 <212> DNA  
 <213> Homo sapiens

<400> 42  
 ggatgtagga 10

<210> 43  
 <211> 17  
 <212> PRT  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (0)...(0)



<223> Xaa at any position = any amino acid

<400> 43

Cys Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa  
1 5 10 15  
Cys

<210> 44

<211> 866

<212> DNA

<213> Mus musculus

<400> 44

cttttttttt	ttccttttaa	gcccacaagg	attgaagttc	agatcaaaac	gttcacttgc	60
taattatctt	ctcaaaaatg	gggagacttt	tcttaagcct	gaagatttta	atcttactgt	120
actgccgaaa	gggagcatca	atcccgggta	taaacaccaa	agtttggcag	ctctgacttc	180
cctgcagcca	aatgaaactg	acgtttcaaa	gcagaacctc	aagacacgaa	gcaagtggaa	240
aacagatgtg	ttgcctctgc	ccagtgggtac	ttcagagtcg	ccagaaagca	gctgactgtc	300
taactctaac	tcggcttgct	tgctattgag	agaacatagg	gacattcagg	atgttgactc	360
tgagaagagg	agaaaagtcca	aaagaaaggt	gactgttttg	aaagggaactg	caagtcagaa	420
aaccaaacaa	aagtgcagga	agagtctctt	agagtctact	caaagaaaaca	gaaaaagagc	480
atctgtgggt	cagaaggtgg	gtgctgatcg	cgagctgggtg	ccacaggaaa	gtcaactcaa	540
cagaaccttc	tgccctgcag	atgcctgtgc	aaggagagact	gttggcctgg	ctggggaaga	600
aaaaatcaca	agcccaggac	tggatctttg	tttcatacaa	gtaacttctg	gcaccacaaa	660
caaattccat	tcaactgaag	cagcaggtga	agcaaatcgt	gagcagactt	ttttagaatc	720
agaggaaatc	agatcgaagg	gagacagaaa	gggggaggca	catttgcata	ctgggtgtttt	780
acaggatggc	tctgaaatgc	ccagctgctc	acaagccaag	aaacacttta	cttctgagac	840
atttcaagggt	actcagtgc	tgaaaa				866

<210> 45

<211> 121

<212> DNA

<213> Mus musculus

<400> 45

gactataaac	taattttgct	tctcagaaga	cagcatccca	cggacacaag	tagaaaaaag	60
gaaaacaagc	ctgtattttt	ccagcaagta	caacaaagaa	ggtaccacc	tttccctaag	120
c						121

<210> 46

<211> 166

<212> DNA

<213> Mus musculus

<220>

<221> misc\_feature

<222> (0)...(0)

<223> n at any position may be a, t, c, or g

<400> 46

tatatttntg	nagctcttag	cccccaaga	cgaaatcct	tcaagaaatg	gacccctcct	60
cggtcacctt	ttaatcttgt	tcaagaaata	cttttccatg	acccatggaa	gtcctcctc	120
gcgactatat	ttctcaatcg	gacctcaggt	tnnggggtcat	tgncat		166

<210> 47

<211> 183

<212> DNA

<213> Mus musculus

<400> 47

tgtttatgct	ccccaggcaa	gatggccatc	cctgtgctgt	gggagtttct	agagaagtac	60
ccttcagctg	aagtggcccg	agctgccgac	tggaggagac	tgctcgagct	tctcaagcct	120

cttgggtctct acgatctccg tgcaaaaacc attatcaagt tctcaggtat gtccccagcc 180  
cag 183

<210> 48  
<211> 143  
<212> DNA  
<213> Mus musculus

<400> 48  
tggatgtgta tccctcagat gaatatctga caaagcagtg gaggtatccg attgagcttc 60  
atgggatttg gttaaaatat ggcaacgact ctaccggatc ttttgtgtca atgaatggaa 120  
caggtaaagg caccactggg gcc 143

<210> 49  
<211> 810  
<212> DNA  
<213> Homo sapiens

<400> 49  
tttgggaagac aggaaatact cccatagcac aagactgggc cactactgact ttaatctccc 60  
tcatttttaac atggataatc tatgtgggtc ctgcattgtc atggattaaa actgagtagg 120  
cagtgggaaga taaattttta ataatgttaac cacttagact ttgtttttcc agcaaaagaag 180  
atgttgctat ggaattggaa agagtgggag aagatgagga acaaatgatg ataaaaagaa 240  
gcagtgaatg taatcccttg ctacaagaac ccacgccttc tgctcagttt ggtgctactg 300  
caggaacaga atgccgtaag tctgtcccat gtggatggga aagagttgtg aagcaaagg 360  
tatttgggaa gacagcagga agatttgatg tgtactttat caggtaagca tataagatgg 420  
taaagatagt acagccaaat gattttgtct gggcaggtag tgggagcata gcaggaatct 480  
tagcttcttt atatttttac cataaaacca ttgcagatcc tattctttca atgttgctat 540  
taattacatc aagtgatttg gggaaaatta catacatttt gtcctctcct ctgtgaatgg 600  
ttaacgggta ggttgcatct tagttatatt tataaattta tattgtcata gaggaacct 660  
ttaaaaggcc attatcactc tttttcattt ttaaatgaca gagacctatg gcaacatttg 720  
gaaattaatt agaacttgaa atgtggtcca gttcttttaa aagtcctctc tatttactag 780  
cagtaagttt cctttaatat cattttctag 810

<210> 50  
<211> 1017  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> (0)...(0)  
<223> n at any position may be a, t, c, or g

<400> 50  
aatctgaaat gtgggtccagt tcttttataaa gtcccttcta tttactagca gtaagtttcc 60  
tttaatatca ttttctagcc cacaaggact gaagttcaga tccaaaagtt cacttgctaa 120  
ttatcttcac aaaaatggag agacttctct taagccagaa gattttgatt ttactgtact 180  
ttctaaaagg ggtatcaagt caagatataa agactgcagc atggcagccc tgacatccca 240  
tctacaaaac caaagtaaca attcaaactg gaacctcagg acccgaagca agtgcaaaaa 300  
ggatgtgttt atgccgcaa gtagtagttc agagttgcag gagagcagag gactctctaa 360  
ctttacttcc actcatttgc ttttgaaaga agatgagggg gttgatgatg ttaacttcag 420  
aaagggttaga aagcccaaag gaaaggtgac tattttgaaa ggaatcccaa ttaagaaaac 480  
taaaaaagga tgtaggaaga gctgttcagg tttgttcaa agtgatagca aaaganaatc 540  
tgtgtgtaat aaagcagatg ctgaaagtga acctgttgca caaaaaagtc agcttgatag 600  
aactgtctgc atttctgatg ctggagcatg tggtagagacc ctcatgtgta gcagtgaaga 660  
aaacngcctt gtaaaaaaaa aagaaagatc attgagtcca ggatcaaatt tttgttctga 720  
acaaaaaact tctggcatca taaacaaatt ttgttcagcc aaagactcag aacacaagca 780  
gaagtatgag gatccctttt tagaatctga agaaatcgga acaaaaagtag aagttgtgga 840  
aaggaaagaa catttgcata ctgacatttt aaaacgtggc tctgaaatgg acaacaactg 900  
ctaccaacc aggaaagact tcaactggtga gaaaatattt caaggtatcc agtgctttca 960  
gcactattaa acattagtga tgagaaatct atatgctgca tctgtatcgt gccatac 1017

<210> 51  
 <211> 613  
 <212> DNA  
 <213> Homo sapiens

<400> 51  
 tagtaccaag ttcattgggtc attagttaga ttaattgggt atttatgtaa agggcttaga 60  
 atagtgcctg gcatgctttg taatagtgtt gatattatta tttgcatccc tcaatattgc 120  
 tttaagctaa accatagact ccataaagtg tttacttttc cttttcagaa gataccatcc 180  
 cacgaacaca gatagaaaga aggaaaacaa gctgtatttt ttccagcaaa tataacaaag 240  
 aaggtatccc tttcccaatc agaacagcaa attctaattc cattttgggt tttcaattct 300  
 gatgcactat gtttggttag ctcttagccc cccacgacgt aaagccttta agaaatggac 360  
 acctcctcgg tcacctttta atctcgttca agaaacactt tttcatgatc catggaagct 420  
 tctcatcgct actatatttc tcaatcggac ctccaggtttg gggattatta tcatctttgt 480  
 cttagtagag acagtgtggg agggagaaag cactgaattg aggcctgggt tcaaagtcac 540  
 tttgagtggt tcacctggga tagggcattc cccctttcac ccttaaaactc ttcacctatg 600  
 aggaaaatgg ggg 613

<210> 52  
 <211> 463  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (0)...(0)  
 <223> n at any position may be a, t, c, or g

<400> 52  
 ccagtgtttt ttgttttttg ttttctttaa aaaaaaaaaa aaaccctctg gatgagattt 60  
 ctatgagaaa ctacttgaac gtgaaatcag cccacctgga gtcttgtaat cattcagtta 120  
 cttttacntt cccaggcaaa atggcaatac ctgtgctttg gaagtttctg gagaagtatc 180  
 cttcagctga ggtagcaaga accgcagact ggagagatgt gtcagaactt cttaaacctc 240  
 ttggtctcta cgatcttcgg gcaaaaacca ttgtcaagtt ctccaggtatt ttcctataca 300  
 cccaaaggaa aaacataata cattgtgctt atttaagaga gccacacctt aaactttaat 360  
 gttctcagat actatattaa tggaggtttt tcagctcaag catttaaaaa agtccacttt 420  
 tccccaaacc acagtctccc actgacctaa acaataaaatc ttt 463

<210> 53  
 <211> 332  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> (0)...(0)  
 <223> n at any position may be a, t, c, or g

<400> 53  
 ctttagaagc tgacctgata atgtgggatg ttgtattctt cagatgaata cctgacaaaag 60  
 cagtgggaagt atccaattga gcttcatggg atttggtaaat atggcaacga ctcttaccga 120  
 attttttctg tcaatgagtg gaagcagggt aggcctcact ccatccataa ttcagcacat 180  
 ttggtctctg aggcaaaata agtccaccat tatggttaag acnattttatt ggggatacaa 240  
 atgctattac agtcacaaca attgtgttcc tggctgcggg gaagcgngtg gcatgtgggt 300  
 tttgggggtt ttgatcagta ggcgtcccca gg 332

<210> 54  
 <211> 623  
 <212> DNA  
 <213> Homo sapiens

<220>

<221> misc\_feature  
<222> (0)...(0)  
<223> n at any position may be a, t, c, or g

<400> 54  
tgtgtgagat taccttaata taagggtataa cttaaaaatat tcatgaatcc caggagggtta 60  
aagggtataa ctttttaggtat tgggtatcgta atgtactgtc ccccagcaaa catttaaaaa 120  
gccaatTTta aaaaatgtat ttctgactaa gttacatnta aggtctctgc ctctgtatct 180  
tatgtttctt ccagggtgcac cctgaagacc acaaattaaa taaatatcat gactggcctt 240  
cccaaaatca tgaaaaatta agtttatctt aaactctgca gctttcaagc tcattctgtta 300  
tgcattgctt tgcacttcaa aaaagcttaa ttaagtacaa ccaaccacct ttccagccat 360  
agagatttta attagcccaa ctagaagcct agtgtgtgtg ctttcttaat gtgtgtgcca 420  
atgggtggatc tttgtactg aatgtgtttg aacatgtttt gagatttttt taaaataaat 480  
tattatttga caacaatcca aaaaaaacac ggcttttcca atgatgaaat ataatcagaa 540  
gatgaaaaat agttctaaac tatcaataat acaaagcaaa tttctatcag ccttgctaaa 600  
gctaggggccc cactaaatat ttt 623

<210> 55  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<400> 55  
ctcgttgtgt tctgagcttt tggc 24

<210> 56  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<400> 56  
cagtgtgacc agtgaagaaa a 21

<210> 57  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<400> 57  
tgaaaggaat cccaattaag 20

<210> 58  
<211> 20  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> primer

<400> 58  
gacagttcta tcaagctgac 20

<210> 59  
<211> 63  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<221> misc\_feature  
<222> (34)...(34)  
<223> n = a, g, c, t

<400> 59  
ccgtcattgct agttcacttt atgcttccgg ctncgctcat gtgtggaatt gtgattaaaa 60  
tcg 63

<210> 60  
<211> 63  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<221> misc\_feature  
<222> (31)...(31)  
<223> n = a, g, c, t, u, e

<221> modified\_base  
<222> (31)...(31)  
<223> e = ethenocytosine

<400> 60  
gcgatttttaa tcacaattcc acacatgacg ngagccggaa gcataaagtg aactagcatg 60  
acg 63

<210> 61  
<211> 63  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<221> misc\_feature  
<222> (33)...(33)  
<223> n = a, g, c, t

<400> 61  
ccgtcattgct agttcacttt atgcttccgg ctncgctcat gtgtggaatt gtgattaaaa 60  
tcg 63

<210> 62  
<211> 63  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<221> misc\_feature  
<222> (31)...(31)  
<223> n = t, u

<221> misc\_feature  
<222> (32)...(32)  
<223> n = a, g, c, t

<400> 62  
gcgatttttaa tcacaattcc acacatgacg nnagccggaa gcataaagtg aactagcatg 60  
acg 63

<210> 63  
<211> 64  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<221> misc\_feature  
<222> (35)...(35)  
<223> n = a, g, c, t

<400> 63  
ccgtcatgct agttcacttt atgcttccgg ctgcncgtca tgtgtggaat tgtgattaaa 60  
atcg 64

<210> 64  
<211> 65  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 64  
ccgtcatgct agttcacttt atgcttccgg ctcggtcgtc atgtgtggaa ttgtgattaa 60  
aatcg 65

<210> 65  
<211> 66  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 65  
ccgtcatgct agttcacttt atgcttccgg ctcggtacgt catgtgtgga attgtgatta 60  
aaatcg 66

<210> 66  
<211> 67  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 66  
ccgtcatgct agttcacttt atgcttccgg ctcggtaccg tcatgtgtgg aattgtgatt 60  
aaaatcg 67

<210> 67  
<211> 68  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 67  
ccgtcatgct agttcacttt atgcttccgg ctcggtactc gtcatgtgtg gaattgtgat 60  
taaaatcg 68

<210> 68  
<211> 68  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 68  
ccgtcatgct agttcacttt atgcttccgg ctcggggggc gtcatgtgtg gaattgtgat 60  
taaaatcg 68

<210> 69  
<211> 62  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 69  
ccgtcatgct agttcacttt atgcttccgg ctcggtcatg tgtggaattg tgattaaaaat 60  
cg 62

<210> 70  
<211> 63  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 70  
gcgattttaa tcacaattcc acacatgacg cgagccggaa gcataaagtg aactagcatg 60  
acg 63

<210> 71  
<211> 37  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 71  
caatcctagc tgacacgatg tggccaatgg catgact 37

<210> 72  
<211> 37

<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<221> misc\_feature  
<222> (22)...(22)  
<223> n = c, t, u, e

<221> modified\_base  
<222> (22)...(22)  
<223> e = ethenocytosine

<400> 72  
gagtcatgcc attggccaca tngtgtcagc taggatt

37

<210> 73  
<211> 30  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic oligonucleotide

<400> 73  
gacttcactg gtgagaaaat atttcaaggt

30